Dr. Yunlong Wang

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Research Interests

Pattern Recognition, Machine Learning, Light field Photography, and Biometrics.

Academic Positions

- **Associate Professor** since Mar. 2022
  Center for Research on Intelligent Perception and Computing (CRIPAC),
  Institute of Automation, Chinese Academy of Sciences (CASIA)
- **Assistant Professor** Jul. 2019 - Feb. 2022
  Center for Research on Intelligent Perception and Computing (CRIPAC),
  Institute of Automation, Chinese Academy of Sciences (CASIA)

Education

- **Doctor of Engineering** Aug. 2014 - Jun. 2019
  University of Science and Technology of China (USTC)
  Hefei, Anhui, China
  Supervisor: Prof. Tieniu Tan
  Thesis title: Light Field Image Enhancement and Recognition
- **Bachelor of Engineering (honors program)** Aug. 2010 - Jun. 2014
  University of Science and Technology of China (USTC)
  Hefei, Anhui, China
  Thesis title: Image-based Automatic Object Counting Techniques

Projects and Funds

- **Iris Liveness Detection and Recognition Based on Hybrid Light Field Imaging**
  Youth Fund Project of National Natural Science Foundation of China, Jan. 2021 – Dec. 2023
- **Computational Imaging Techniques for High-throughput Iris Recognition**
  General Program of National Natural Science Foundation of China, Jan. 2021 – Dec. 2024
- **Large-scale Iris Image Generation**
  General Program of National Natural Science Foundation of China, Jan. 2022 – Dec. 2025
- **Federated Learning for Biometrics Recognition**
  CAAI-Huawei Mindspore Open Fund, Jan.2022 – Oct.2022
- **Smart Iris Recognition Systems**
  Repository: https://www.researchgate.net/project/Research-on-Smart-Iris-Recognition-systems, since Jul. 2019
- **Computational Light Field Imaging Devices and Algorithms**
  Repository: https://www.researchgate.net/project/Computational-Light-Field-Imaging-Devices-and-Algorithms, since Oct. 2016

Awards

- Best Paper Award Runner-up, International Joint Conference on Biometrics (IJCB 2020)

Professional Activity

- **Reviewing**
  Journals: IEEE TIP, IEEE TIFS, IEEE TCI, IEEE TVCG, IEEE JSTSP, IEEE/CAA JAS, Neurocomputing.
  Conferences: CVPR, ICCV, AAAI, IJCB, CCBR.
- **Organizing committee**
  "NIR Iris Challenge Evaluation in Non-cooperative Environments: Segmentation and Localization" Competition at IJCB 2021
- **Invited talks**
  Beijing University of Posts and Telecommunications, China.
  Hosted by Prof. Zhaofeng He, Dec. 2021
  Beijing Normal University, China.
  Hosted by Prof. Yongzhen Huang, Aug. 2021

Publications

- **Journal**

[1] Perturbation Inactivation Based Adversarial Defense for Face Recognition.
Min Ren, Yuhao Zhu, **Yunlong Wang***, Zhenan Sun.
IEEE Transactions on Information Forensics and Security (**TIFS**), 2022.

[2] Combining 2D texture and 3D geometry features for Reliable iris presentation attack detection using light field focal stack.
Zhengquan Luo, **Yunlong Wang***, Nianfeng Liu, Zilei Wang.
IET Biometrics, 2022.

[3] Towards Interpretable Defense against Adversarial Attacks via Causal Inference.
Min Ren, **Yunlong Wang***, Zhaofeng He.
Machine Intelligence Research (**MIR**), 2022.

[4] Towards More Discriminative and Robust Iris Recognition by Learning Uncertain Factors.
Jianze Wei, Huaibo Huang, **Yunlong Wang***, Ran He, Zhenan Sun.
IEEE Transactions on Information Forensics and Security (**TIFS**), 2022.

[5] Multitask Deep Active Contour-based Iris Segmentation for Off-Angle Iris Images.
Tianhao Lu, Caiyong Wang, **Yunlong Wang**, Zhenan Sun.
Journal of Electronic Imaging (**JEI**), 2022.

[6] Overview of biometrics research (in Chinese).
Zhenan Sun , He Ran , Liang Wang, ..., **Wang Yunlong** , others.
Journal of Image and Graphics (**JIG**), 2022.

[7] Cross-spectral Iris Recognition by Learning Device-specific Band.
Jianze Wei, **Yunlong Wang**, Yi Li, Ran He, Zhenan Sun.
IEEE Transactions on Circuits and Systems for Video Technology (**TCSVT**), 2021.

[8] CASIA-Face-Africa: A Large-scale African Face Image Database.
Muhammad Jawad, **Yunlong Wang**, Caiyong Wang, Kunbo Zhang, Zhenan Sun.
IEEE Transactions on Information Forensics and Security (**TIFS**), 2021.

[9] High-fidelity View Synthesis for Light Field Imaging with Extended Pseudo 4DCNN.
Yunlong Wang, Fei Liu, Kunbo Zhang, Zilei Wang, Zhenan Sun, Tieniu Tan.
IEEE Transactions on Computational Imaging (**TCI**), 2020.

[10] Flexible Iris Matching Based on Spatial Feature Reconstruction.
Zihui Yan, Lingxiao He, **Yunlong Wang**, Zhenan Sun, Tieniu Tan.
IEEE Transactions on Biometrics, Behavior, and Identity Science (**TBIOM**), 2021.

[11] Towards Complete and Accurate Iris Segmentation Using Deep Multi-task Attention Network for Non-Cooperative Iris Recognition.
Caiyong Wang, Jawad Muhammad, **Yunlong Wang**, Zhaofeng He and Zhenan Sun.
IEEE Transactions on Information Forensics and Security (**TIFS**), 2020.

[12] ScleraSegNet: An Attention Assisted U-Net Model for Accurate Sclera Segmentation.
Caiyong Wang, **Yunlong Wang**, Yunfan Liu, Zhaofeng He, Ran He and Zhenan Sun.
IEEE Transactions on Biometrics, Behavior, and Identity Science (**TBIOM**), 2020.

[13] Binocular Light-Field: Imaging Theory and Occlusion-Robust Depth Perception Application.
Fei Liu, Shubo Zhou, **Yunlong Wang**, Zhenan Sun, Tieniu Tan.
IEEE Transactions on Image Processing (**TIP**), 2019.

[14] Iris Liveness Detection Based on Light Field Imaging.
Ping Song, Ling Huang, **Yunlong Wang**, Fei Liu, Zhenan Sun.
IEEE/CAA Journal of Automatica Sinica (**JAS**), 2019.

[15] LFNet: A Novel Bidirectional Recurrent Convolutional Neural Network for Light-Field Image Super-Resolution.
Yunlong Wang, Fei Liu, Kunbo Zhang, Guangqi Hou, Zhenan Sun, Tieniu Tan.
IEEE Transactions on Image Processing (**TIP**), 2018.

- **Conference full paper**

[1] PDVN: A Patch-based Dual-view Network for Face Liveness Detection using Light Field Focal Stack.
Yunlong Wang, Mupei Li, Zhengquan Luo, Zhenan Sun.
International Joint Conference on Biometrics (**IJCB**), 2022.

[2] D-ESRGAN: A Dual-Encoder GAN with Residual CNN and Vision Transformer for Iris Image Super-Resolution.
Caiyong Wang, Tianhao Lu, Gaosheng Wu, **Yunlong Wang**, Zhenan Sun.
International Joint Conference on Biometrics (**IJCB**), 2022.

[3] Disentangled Federated Learning for Tackling Attributes Skew via Invariant Aggregation and Diversity Transferring.
Zhengquan Luo , **Yunlong Wang*** , Zilei Wang , Zhenan Sun , Tieniu Tan.
International Conference on Machine Learning (**ICML**), 2022.

[4] FedIris: Towards More Accurate and Privacy-preserving Iris Recognition via Federated Template Communication.
Zhengquan Luo, **Yunlong Wang*,** Zilei Wang, Zhenan Sun, Tieniu Tan.
Computer Vision and Pattern Recognition Workshops (**CVPRW**), 2022.

[5] Learning Instance-level Spatial-Temporal Patterns for Person Re-identification.
Min Ren, Lingxiao He, Xingyu Liao, Wu Liu, **Yunlong Wang**, Tieniu Tan.
International Conference on Computer Vision (**ICCV**), 2021.

[6] NIR Iris Challenge Evaluation in Non-cooperative Environments: Segmentation and Localization.
Caiyong Wang, **Yunlong Wang**, Kunbo Zhang, Jawad Muhammad, Tianhao Lu, Qi Zhang, Qichuan Tian, Zhaofeng He, Zhenan Sun.
International Joint Conference on Biometrics (**IJCB**), 2021.

[7] A Large-scale Database for Less Cooperative Iris Recognition.

Junxing Hu, Leyuan Wang, Zhengquan Luo, **Yunlong Wang***, Zhenan Sun.
International Joint Conference on Biometrics (**IJCB**), 2021.

[8] An End-to-End Autofocus Camera for Iris on the Move.
Leyuan Wang, Kunbo Zhang, **Yunlong Wang**, Zhenan Sun.
International Joint Conference on Biometrics (**IJCB**), 2021.

[9] Iris Normalization Beyond Appr-Circular Parameter Estimation.
Zhengquan Luo, Haiqing Li, **Yunlong Wang**, Zilei Wang, Zhenan Sun.
Chinese Conference on Biometric Recognition (**CCBR**), 2021.

[10] A Novel Deep-learning Pipeline for Light Field Image Based Material Recognition.
Yunlong Wang, Kunbo Zhang, Zhenan Sun.
International Conference on Pattern Recognition (**ICPR**). 2021.

[11] A Lightweight Multi-Label Segmentation Network for Mobile Iris Biometrics.
Caiyong Wang, **Yunlong Wang**, Boqiang Xu, Yong He, Zhiwei Dong, Zhenan Sun.
International Conference on Acoustics, Speech, and Signal Processing (**ICASSP**), 2020.

[12] Dynamic Graph Representation for Occlusion Handling in Biometrics.
Min Ren, **Yunlong Wang**, Zhenan Sun, Tieniu Tan.
Thirty-Fourth AAAI Conference on Artificial Intelligence (**AAAI**), 2020.

[13] Recognition Oriented Iris Image Quality Assessment in the Feature Space.
Leyuan Wang, Kunbo Zhang, Min Ren, **Yunlong Wang**, Zhenan Sun.
International Joint Conference on Biometrics (**IJCB**), 2020.

[14] All-in-Focus Iris Camera with a Great Capture Volume.
Kunbo Zhang, Zhenteng Shen, **Yunlong Wang**, Zhenan Sun.
International Joint Conference on Biometrics (**IJCB**), 2020.
Best Paper Award Runner-up

[15] SSBC 2020: Sclera Segmentation Benchmarking Competition in The Mobile Environment.
Junxing Hu, Yonghe He, Caiyong Wang, Hui Liu, **Yunlong Wang**, Zhenan Sun.
International Joint Conference on Biometrics (**IJCB**), 2020.

[16] Alignment Free and Distortion Robust Iris Recognition.
Min Ren, Caiyong Wang, **Yunlong Wang**, Zhenan Sun, Tieniu Tan.
International Conference on Biometrics (**ICB**), 2019.

[17] Cross-Sensor Iris Recognition Using Adversarial Strategy and Sensor-Specific Information.
Jianze Wei, **Yunlong Wang**, Xiang Wu, Zhaofeng He, Ran He, Zhenan Sun.
International Conference on Biometrics: Theory, Applications and Systems (**BTAS**), 2019.

[18] End-to-end View Synthesis for Light Field Imaging with Pseudo 4DCNN.
Yunlong Wang, Fei Liu, Zilei Wang, Guangqi Hou, Zhenan Sun, Tieniu Tan.
European Conference on Computer Vision (**ECCV**), 2018.

[19] A Simple and Robust Super Resolution Method For Light Field Images.
Yunlong Wang, Guangqi Hou, Zhenan Sun, Zilei Wang, Tieniu Tan.
International Conference on Image Processing (**ICIP**), 2016.

[20] 4D Light-Field Sensing System for People Counting.
Guangqi Hou, Chi Zhang, **Yunlong Wang**, Zhenan Sun.
Photonic and Optoelectronic Integrated Circuits XVIII (**SPIE OPTO**), 2016.